



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,310	10/31/2003	Ian Robinson	NG(ST)-6564	5457
26294 7590 04/13/2010 TAROLLI, SUNDHEIM, COVELL & TUMMINO L.L.P. 1300 EAST NINTH STREET, SUITE 1700 CLEVELAND, OH 44114				
EXAMINER				
LEE, SIU M				
ART UNIT		PAPER NUMBER		
2611				
MAIL DATE		DELIVERY MODE		
04/13/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/700,310

Applicant(s)

ROBINSON, IAN

Examiner

SIU M. LEE

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-5, 7, 10, 11, 34, 44, 49-52, 54-56, 63 and 64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-5, 7, 10-11, 34, 56, 63-64 is/are rejected.
- 7) ☒ Claim(s) 44, 49-52, 54 and 55 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-840)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-5, 7, 10-11, 34, 44, 49-52, 54-56, 63-64 have been considered but are moot in view of the new ground(s) of rejection.
2. The indicated allowability of claims 56, 63-64 are withdrawn in view of the new matter issue. Rejections based on the newly cited reference(s) follow.

Claim Objections

3. Claims 44, 49-52, and 54-55 are objected to because of the following informalities:

Independent claim 44 recites a limitation "a bypass configured to allow an analog signal from **at least one of the plurality of antennas** to bypass the signal combiner". The examiner interprets claim 44 is directed to the embodiment discloses in figure 9, wherein the embodiment comprises a tracking assembly 502 for tracking a large blocking signal (paragraph 0061).

The above limitation includes condition that more than one analog signal from the plurality of antennas to bypass the signal combiner; as point out in paragraph 0061 of the instant application, "digital processing assembly 514 channelizes the digital signal and determines a channel, not associated with one or more desired carrier frequencies, having a maximum magnitude". Therefore, only one or the analog signal from an

antenna is enough for the digital processing assembly 514 to detect the blocking signal as shown in figure 9. Figure 9 shows signal from antenna 504 is forward to the digital processing assembly 514 through the bypass assembly (tracking assembly 502). As a result, there is no teaching in the instant application to "a bypass configured to allow an analog signal from **at least one of the plurality of antennas** to bypass the signal combiner"; the examiner suggest changing the limitation to "a bypass configured to allow an analog signal from **at least one of the plurality of antennas** to bypass the signal combiner".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claims 1, 3-5, 7, 10-11, 56, and 63-64 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(1) Regarding claims 1, 3-5, 7, 10-11:

Independent claim 1 recites a multi-carrier transmitter assembly comprising a signal distributor that deserializes the analog multi-carrier signal into a plurality of analog carrier signals, the signal distributor comprising **a time division demultiplexer**, and **at least one stop band filter having at least one stopband, each of the at least one stopband having an associated center frequency, the digital exciter being**

operative to adjust the respective center frequencies of the at least one stopband". The examiner assume the claim is directed to the embodiment disclose in figure 5 wherein the transmitter comprises a time division demux 166 for deserialize the combined signal (paragraph 0044).

Applicant response filed on 1/22/2010 amended figure 5 with a filter control signal from exciter 152 to filters 168, 170, 172, and 174. However, paragraph 0033 (page 7, lines 1-3) of the instant application discloses that signal distributor may comprises a demultiplexer and **alternatively**, the signal distributor can comprises one or more filters that attenuate unwanted carriers. The disclosure of the instant application does not disclose using two embodiments together (figure 4 and 5). The invention is directed to separating signal for a plurality of antennas; the embodiment in figure 5 uses a time division demultiplexer for separating a multicarrier signal; the embodiment in figure 4 is using tunable or selectable filters for separating a multicarrier signal, therefore, when using a time division demultiplexer for separating the multicarrier signal, it would not be using tunable or selectable filters for separating a multicarrier signal to be transmitted by a plurality of antennas.

(2) Regarding claims 56, 63-64:

Independent claim 56 recites "a code division multiplexer that combines the analog signals from the plurality of antennas into an analog multicarrier signal" that is direct to CDMA multiplexer 462 as shown in figure 8, therefore, the examiner interpret claim 56 is directed to the embodiment in figure 8.

Claim 56 further recites "a plurality of electrically adjustable passband filters, each electrically adjustable passband filter being associated with one of the plurality of antennas, a given electrically adjustable passband filter being electrically adjustable to change respective associated center frequencies of at least one passband associated with the filter in response to the control signal associated with the associated antenna of the given adjustable filter as to attenuate the specified at least one frequency band within the analog signal received at the associated antenna of the given adjustable filter"; the only control signal in figure 8 is from the digital processing assembly 466 for computing and maintaining the codes for each signal path and providing codes to the spreaders, and controlling and correlating the multiplexing and demultiplexing of the plurality of carrier signals as describes in paragraph 0057, lines 14-22.

Therefore, there is no teaching in the specification for implementing the embodiment is figure 8 with a control signal to control adjustable filter as to attenuate the specified at least one frequency band within the analog signal received at the associated antenna of the given adjustable filter.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Toivola (US 6,081,515) in view of Bada et al. (US 6,611,565 B1) and Kanemoto et al. (US 2002/0159426 A1, hereinafter Kanemoto).

(1) Regarding claim 34:

Toivola discloses a method of transmitting a multi-carrier signal (the examiner interprets a multi-carrier signal is a multi-frequency signal as signal output from the combiner 1 in figure 3), comprising:

generating a multi-carrier signal at an exciter (frequency combiner 1 in figure 3, by the combination in the combiner device 1 a multi-frequency signal is received, column 6, lines 13-15, lines 33-34);

distributing the multi-carrier signal into a plurality of analog signals (power combiner 3 is basically the same as a power divider, column 6, lines 44-46), where distributing the analog multi-carrier signal comprises filtering a plurality of copies of the multi-carrier analog signal at respective tunable filters (each signal output from the power combiner 3 is filtered by electrically controllable filter $4_1...4_n$ as shown in figure 3, column 6, lines 53-64); and

providing the plurality of analog signals to respective antennas for transmission (the output of the electrically controllable filter $4_1...4_n$ are output to the amplifier $5_1...5_n$ and transmit from the antenna $6_1...6_n$ as shown in figure 3, column 6, lines 54 – column 7, lines 4).

Toivola fails to disclose (a) generating a digital multi-carrier signal at an exciter and converting the digital multi-carrier signal into an analog multi-carrier signal, and (b)

distributing the analog multi-carrier signal by providing despreading signals to respective copies of the analog multi-carrier signal to recover the plurality of analog signals.

With respect to (a), Bada et al. discloses a transmitter comprising means for digital modulation of a multicarrier signal; means for summing the numeric samples of the modulation carriers; and means for conversion to analogue from (DAC) of the signal (figure 8, column 6, lines 41-48).

It is desirable to generate a digital multi-carrier signal at an exciter and converting the digital multi-carrier signal into an analog multi-carrier signal because through digital processing, it can increase the space of the useful signal from the continuous base band spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Bada et al. in the method of Toivola to improve the throughput of the transmitting method.

With respect to (b), Kanemoto teaches using despreading code to separate combined signal in a multicarrier signal (paragraph 0079, 0080, figure 10); although Kanemoto discloses using despreading code for receiving, as a general application, despreading code is well known in the art that is used to separate combined spreaded signal and retrieve spreaded signal that is spreaded with the same code.

It is desirable to use despreading code for separating combined multicarrier signal because it can improve spectrum efficiency by using orthogonal despreading code. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Kanemoto and modify the transmitter of Toivola and

Bada and uses dispreading code for recovering the plurality of analog signals and improve the spectrum efficiency of the transmitter.

Allowable Subject Matter

2. Claims 44, 49-52, 54-55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in to overcome the claim objection on claim 44.
3. The following is a statement of reasons for the indication of allowable subject matter:

(1) Regarding claim 44, 50-51, and 54-55:

The present invention describes a receiver assembly, comprising a plurality of antennas that each receive an analog signal comprising at least one frequency band of interest and at least one frequency band containing an interfering signal; a signal combiner that combines at least two of the analog signals from the plurality of antennas into a multi-carrier signal; a bypass configured to allow an analog signal from one of the plurality of antennas to bypass the signal combiner; an analog-to-digital converter that creates a digital representation of the multi-carrier signal; a digital processing component that receives the digital representation of the multi-carrier signal and produces a control signal from the digital representation for each analog signal, representing an associated antenna, specifying the at least one frequency band containing the interfering signal; and a plurality of electrically adjustable stopband filters, each electrically adjustable stopband filter being associated with one of the plurality of

antennas, a given electrically adjustable stopband filter being electrically adjustable to change respective associated center frequencies of at least one stopband associated with the filter in response to the control signal associated with the associated antenna of the given adjustable filter as to attenuate the specified at least one frequency band within the analog signal received at the associated antenna of the given adjustable filter. The closest prior art, Caimi et al. (US 2004/0227683 A1) in view of Nuutinen et al. (US 2003/0016771 A1) and Pratt (US6,664,921 B2) discloses a similar system but fail to disclose a bypass configured to allow an analog signal from one of the plurality of antennas to bypass the signal combiner and a digital processing component that receives the digital representation of the multi-carrier signal and produces a control signal from the digital representation for each analog signal, representing an associated antenna, specifying the at least one frequency band containing the interfering signal; and a plurality of electrically adjustable stopband filters, each electrically adjustable stopband filter being associated with one of the plurality of antennas, a given electrically adjustable stopband filter being electrically adjustable to change respective associated center frequencies of at least one stopband associated with the filter in response to the control signal associated with the associated antenna of the given adjustable filter as to attenuate the specified at least one frequency band within the analog signal received at the associated antenna of the given adjustable filter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SIU M. LEE whose telephone number is (571)270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Siu M Lee/
Examiner, Art Unit 2611
4/4/2010

/CHIEH M FAN/
Supervisory Patent Examiner, Art Unit 2611

